

## The Spider Family Clubionidae (Arachnida: Araneae) from the Krakatau Islands, Indonesia

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**Abstract** Spider specimens of the family Clubionidae taken from the Krakatau Islands, Indonesia, are classified into four species, that is, two known species, *Cheiracanthium longipes* THORELL, 1890, and *Clubiona melanosticta* THORELL, 1890, and two new species, *Clubiona nentwigi* sp. nov. and *Cl. sertungensis* sp. nov.

The Krakatau Islands is situated between Java and Sumatra (Fig. 1). THORELL (1881, 1890), WORKMAN (1896) and STRAND (1916) described several clubionid spiders from Sumatra. Some works on the spiders from the vicinity of the Krakatau Islands were made by THORELL (1878) (from Amboina), STRAND (1913) (from Lombok) and MERIAN (1911) (from Celebes). Through the works of KOLOSVÁRY (1934), HOGG (1915) and CHRYSANTHUS (1967), many species of the Clubionidae were described from New Guinea.

Recently, KOH (1989) recorded *Oedignatha scrobiculata* THORELL, 1881, and three undetermined clubionids from Singapore. At the present, the genus *Oedignatha* is a member of the family Corinnidae (PLATNICK, 1989).

From the Krakatau Islands, six species of clubionid spiders were recorded by DAMMERMANN (1948), that is, *Cheiracanthium longipes* THORELL, 1890, *Clubiona melanosticta* THORELL, 1890, *Oedignatha scrobiculata* THORELL, 1881, *Matidia tenera* THORELL, 1890, *Castianeira* sp. and *Orthobula* sp.

Through the courtesy of Prof. Dr. Wolfgang NENTWIG, University of Bern, I had an opportunity to study the clubionid spiders collected on the Krakatau Islands. He collected the specimens by several methods as pitfall trapping, and sweepnet and hand collections. Most specimens were collected in Anak Krakatau Island, and some spiders came from Sertung and Panjang Islands.

These specimens (the total number amounts to 35) are classified into four species belonging to two genera, *Cheiracanthium* and *Clubiona*. In this paper, I intend to give descriptions of them.

The holotypes and allotypes of the species recorded in this paper are deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

The abbreviations used in this paper are as follows: ALE, anterior lateral eye; AME, anterior median eye; PLE, posterior lateral eye; PME, posterior median eye.

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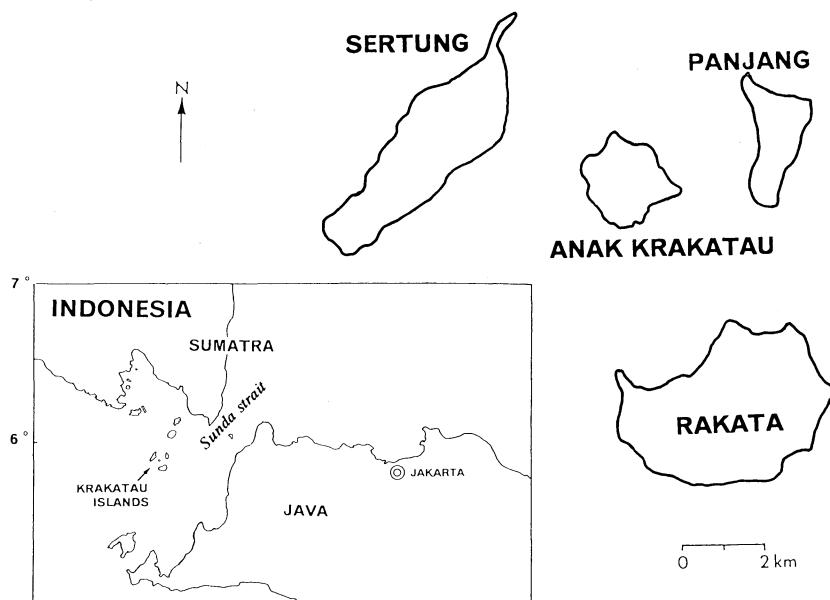


Fig. 1. Map of the Krakatau Islands.

Genus *Cheiracanthium*

*Cheiracanthium longipes* THORELL, 1890  
(Figs. 2-6)

*Cheiracanthium longipes* THORELL, 1890, p. 372 (♀). — DAMMERMAN, 1948, p. 559. — ROEWER, 1954, p. 487.

*Specimens examined.* 1 ♀, 1 ♂, Sertung Island, 17-VIII-4-IX-1990, W. NENTWIG leg.; 1 ♂, Anak Krakatau Island, W. NENTWIG leg.

*Description* (based on 1 ♀ and 1 ♂ from Sertung). Measurements (♀/♂; in mm). Carapace length 2.44/2.26, width 1.46/1.98. Abdomen length 3.05/3.29, width 2.05/1.83. Eye size and interdistance: AME=ALE=PLE 0.10/0.15; PME 0.10/0.15, AME-AME 0.12/0.14, AME-ALE 0.17/0.22, PME-PME 0.10/0.20, PME-PLE 0.10/0.24. MOA anterior width 0.37/0.41, posterior width 0.44/0.49, length 0.31/0.39. Clypeus 0.05/0.07.

Table 1. Lengths of legs of *Cheiracanthium longipes* THORELL, 1890 (♀♂; in mm).

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	3.83/2.49	1.10/0.98	4.02/2.54	4.76/2.63	1.22/0.78	14.93/9.42
II	2.80/1.83	0.83/0.83	2.44/1.61	2.63/1.66	0.71/0.63	9.41/6.56
III	1.88/1.34	0.73/0.73	1.54/0.98	2.02/1.24	0.61/0.61	6.78/4.90
IV	2.88/2.05	0.80/0.76	2.37/1.83	3.22/2.20	0.80/0.66	10.07/7.50

Legs. Leg-formula IV-I-II-III. Ventral spines on legs I and II (male): tibia I 1-1-2, II 0-2-0; metatarsus I 2-2-0, II 2-2-0.

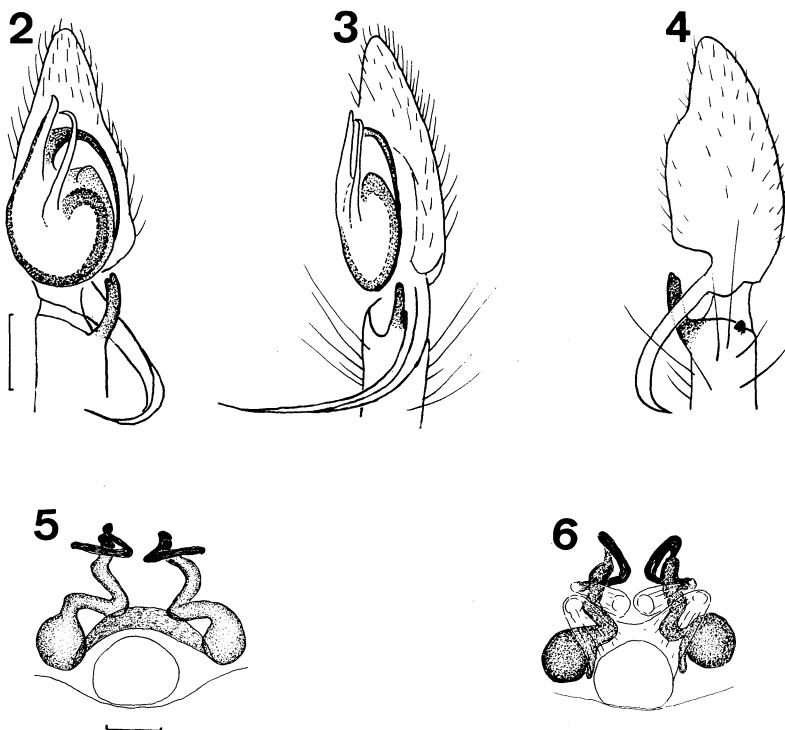
Male palp (Figs. 2-4). Tibia with a retrolateral apophysis devided into two parts at tip and a small dorsal apophysis (Fig. 4). Cymbium with very long spur extending from tibial apophysis to ventral side. Tegular apophysis slender and falcate at tip, embolus arising at distal end of tegulum, encircling tegulum, tip lying on membranous conductor at distal end of tegulum.

Female genitalia (Figs. 5-6.). Epigynum with a hood sickle-moon-shaped and situated in the front of the copulatory opening. Copulatory opening round. Spermathecae round with winding ducts (Fig. 6).

Coloration and markings. ♀♂, Cephalothorax light brown. Chelicerae reddish brown. Maxillae and labium light brown. Sternum light yellow. Legs, palps and spinnerets pale light brown. Dorsum and venter of abdomen grayish yellow without markings.

*Distribution.* Indonesia: Krakatau Islands (Anak Krakatau, Sertung).

*Remarks.* The present species resembles *Cheiracanthium marplesi* CHRYSANTHUS, 1967, from New Guinea, but can be distinguished from the latter by the shape of tegular apophysis and spur of cymbium longer and strongly curved. Dorsal apo-



Figs. 2-6. *Cheiracanthium longipes* THORELL, 1890.—2, Male palp, ventral view. 3, Do., lateral view. 4, Do., dorsal view. 5, Epigynum. 6, Female genitalia, ventral view. (Scales: 0.125 mm.)

physis of tibia of the present species (Fig. 4) is smaller than that of *Ch. marplesi*.

According to the original description of *Eutiththa montana* made by THORELL (1890), *Cheiracanthium longipes* THORELL and *Ch. turiae* STRAND 1916 (= *Eutiththa montana* THORELL, 1890) from Sumatra may be the same species.

### Genus *Clubiona*

#### Species group of *Clubiona viridula* ONO, 1989

**Diagnosis.** Body color yellow to yellowish green. Tibial apophysis of male palp with several little dentations on the distal part. Male palp simple, embolus very long, curved around tegulum and contact with anterior part of tegulum. Two copulatory openings contact with each other at the middle of epigynal plate, ducts parallel, extending anteriorly, spermathecae divided into two parts and reniform, respectively.

The species of this group are known from tropical and subtropical regions.

#### *Clubiona nentwigi* sp. nov.

(Figs. 7-13)

**Type series.** Holotype: ♀, Anak Krakatau Island, Indonesia, 17-VIII-4-IX-1990, W. NENTWIG leg. Allotype: ♂, same data as for the holotype.

**Other specimens examined.** 5 ♀, 3 ♂, same data as for the holotype.

**Description** (based on the holotype and allotype). Measurements (♀/♂, in mm). Carapace length 2.59/2.71, width 1.70/1.71. Abdomen length 3.29/4.39, width 1.22/1.15. Eye size and interdistance: AME 0.09/0.10, ALE 0.12/0.12, PME 0.10/0.10, PLE 0.11/0.11; AME-AME 0.10/0.10, AME-ALE 0.09/0.09, PME-PME 0.32/0.32, PME-PLE 0.14/0.15. MOA anterior width 0.26/0.30, posterior width 0.49/0.53, length 0.30/0.30. Clypeus 0.06/0.07.

**Legs.** Leg-formula IV-II-I-III. Ventral spines on legs I and II (female): tibia I 2-2-0, II 2-2-0; metatarsus I-II without spines.

**Male palp** (Figs. 8-10). Tibia with a retrolateral apophysis not so developed. Bulb unique, with a tegular apophysis projecting in the anterior part. Embolus long and lying on tegular apophysis in its central part.

**Female genitalia** (Figs. 11-13). Copulatory opening small and situated in the middle part of epigynal plate. Ducts transparent, parallel and extending in the anterior direction. Spermatheca reniform with a small atrium on the posterior side.

**Coloration and markings.** ♀ ♂, Cephalothorax, chelicerae maxillae and legs green. Labium and sternum yellowish green. Palps and spinnerets yellow. Dorsum of abdomen pale yellowish green without markings, venter yellow.

**Distribution.** Indonesia: Krakatau Islands (Anak Krakatau).

Table 2. Lengths of legs of *Clubiona nentwigi* sp. nov. (♀ ♂; in mm).

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	2.02/2.44	0.95/1.07	1.83/2.61	1.22/1.71	0.61/0.61	6.63/ 8.44
II	2.44/2.98	1.07/1.32	2.27/3.29	1.61/2.00	0.73/0.80	8.12/10.39
III	1.76/1.83	0.54/0.76	1.34/1.66	1.49/1.46	0.49/0.54	5.62/ 6.25
IV	2.59/2.88	0.88/0.98	2.02/2.56	2.20/2.32	0.68/0.68	8.37/ 9.42

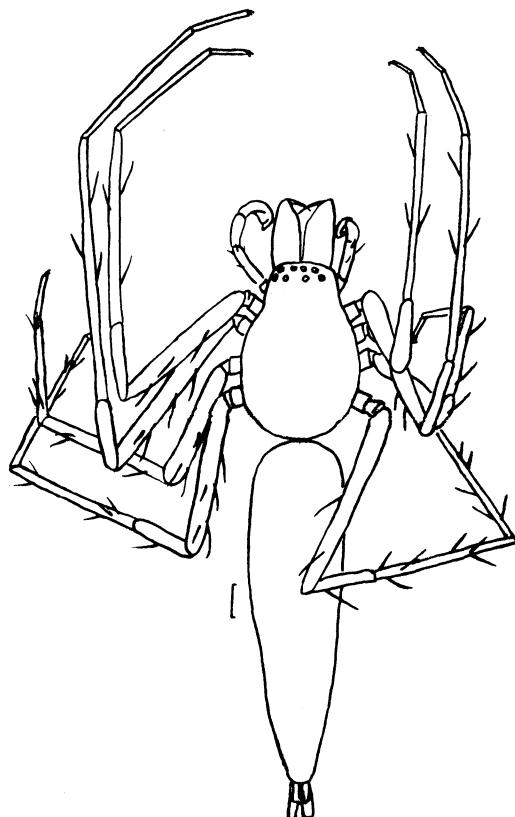


Fig. 7. *Clubiona nentwigi* sp. nov., male, dorsal view. (Scale: 1 mm.)

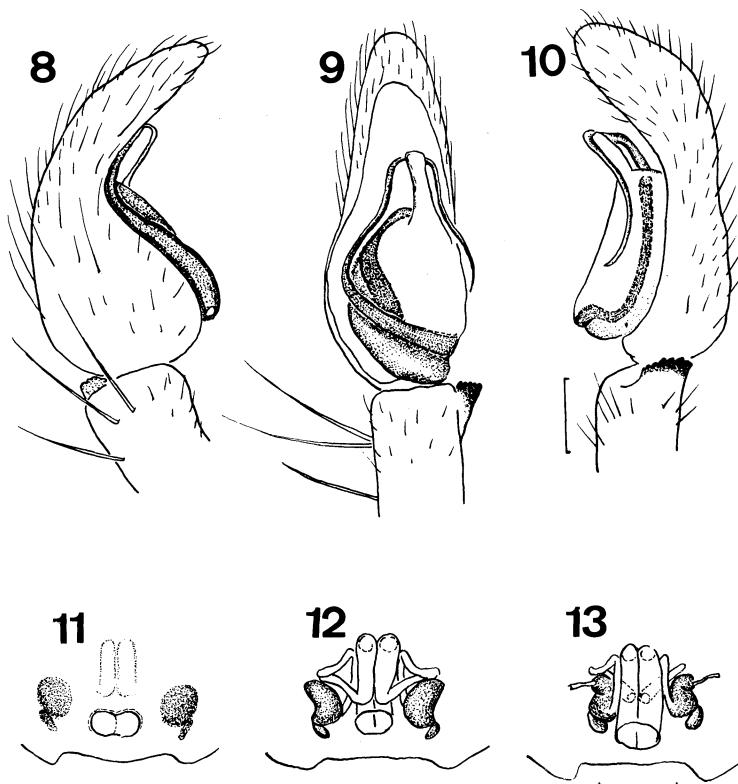
**Remarks.** The new species is similar to *Clubiona viridula* ONO, 1989 described from Iriomote Island, the Ryukyus, Japan, in general appearance, but can be distinguished from the latter by the shapes of tegular apophysis of male palp and spermatheca of female genitalia.

**Etymology.** The species is dedicated to Prof. Dr. Wolfgang NENTWIG, University of Bern.

#### Species group of *Clubiona melanosticta* THORELL, 1890

**Diagnosis.** The species of this group resemble *Clubiona hystrix* BERLAND, 1938 described from New Hebrides, but can be distinguished from the latter by tibial apophysis of male palp not pointed to ventral direction and by the simple structure in female genitalia. Male palp simple, embolus long and curved around the tegulum. Tibial apophysis simple and slender. Copulatory opening inconspicuous and ducts relatively long. Spermathecae divided into two parts, both round.

The members of this group: *Clubiona melanosticta* THORELL, 1890, and *C. sertungensis* sp. nov. from the Krakatau Islands, *C. kowong* CHRYSANTHUS, 1967, *C. ericius*



Figs. 8-13. *Clubiona nentwigi* sp. nov.—8, Male palp, retrolatrel view. 9, Do., ventral view. 10, Do., lateral view. 11, Epigynum. 12, Female genitalia, ventral view. 13, Do., dorsal view. (Scales: 0.1 mm.)

CHYSANTHUS, 1967, *C. papuana* CHYSANTHUS, 1967, *C. pantherina* CHYSANTHUS, 1967, *C. procera* CHYSANTHUS, 1967, and *C. subula* CHYSANTHUS, 1967, from New Guinea, and *C. thorelli* ROEWER, 1951 from Sumatra.

*Clubiona sertungensis* sp. nov.  
(Figs. 14-18, 22)

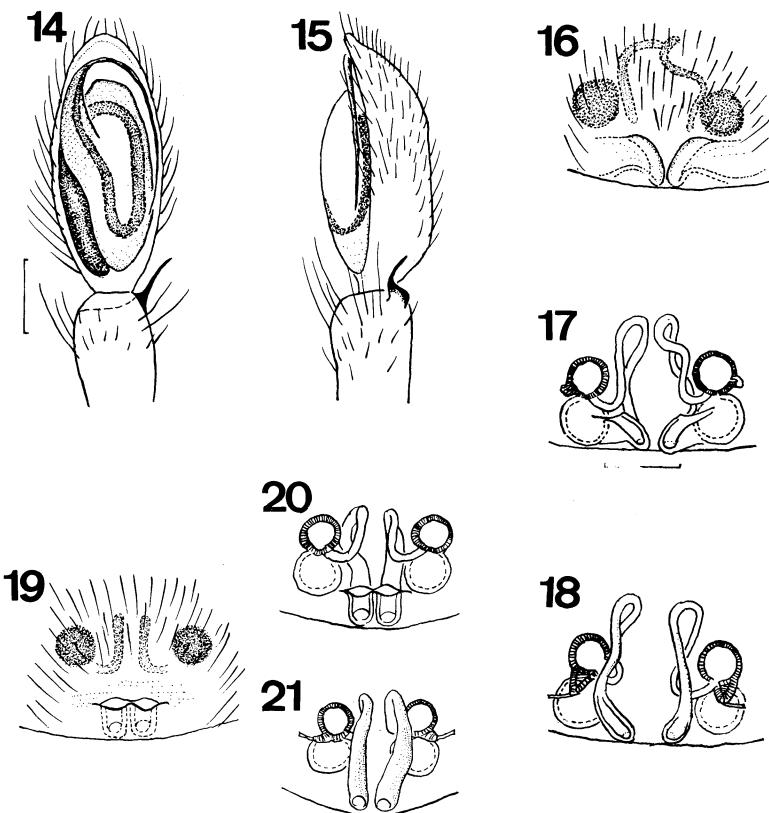
*Type series.* Holotype: ♀, Sertung Island, Krakatau Islands, 17-VIII-4-IX-1990, W. NENTWIG leg. Allotype: ♂, same data as for the holotype.

*Other specimens examined.* 1 ♀, Panjang Island, Krakatau Island, Indonesia, 17-VIII-4-IX-1990, W. NENTWIG leg. 2 ♂; same data as for the holotype.

*Description* (based on the holotype and allotype). Measurements (♀/♂, in mm). Carapace length 2.95/3.78, width 1.95/2.93 Abdomen length 3.41/3.76, width 1.95/1.83. Eye size and interdistance: AME 0.14/0.15, ALE 0.10/0.17, PME 0.12/0.17, PLE 0.14/0.17; AME-AME 0.14/0.15, AME-ALE 0.10/0.15, PME-PME 0.32/0.46, PME-PLE 0.19/0.17. MOA anterior width 0.41/0.44, posterior width 0.59/0.76, length 0.37/0.39.

Table 3. Lengths of legs of *Clubiona sertungensis* sp. nov. ( $\text{♀♂}$ ; in mm).

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	1.78/2.32	0.98/1.34	1.46/1.88	0.98/1.37	0.56/0.73	5.76/7.64
II	1.71/2.32	1.00/1.49	1.46/2.39	1.07/1.59	0.56/0.78	5.80/8.55
III	1.34/1.83	0.76/1.05	0.98/1.37	1.22/1.80	0.49/0.63	4.79/6.68
IV	2.32/2.44	0.98/0.83	1.71/2.32	2.20/2.93	0.61/0.88	7.82/9.40



Figs. 14-21. 14-18. *Clubiona sertungensis* sp. nov.—14, Male palp, ventral view. 15, Do., lateral view. 16, Epigynum. 17, Female genitalia, ventral view. 18, Do., dorsal view. 19-21. *Clubiona melanosticta* THORELL, 1890.—19, Epigynum. 20, Female genitalia, ventral view. 21, Do., dorsal view. (Scales: 0.125 mm.)

Clypeus 0.06/0.07.

Legs. Leg-formula IV-II-I-III. Ventral spines on legs I and II (female): tibia I 2-2-2-1-1, II 2-2-0; metatarsus I without spines, II 1-0.

Female genitalia (Figs. 16-18). Copulatory openings small, indistinct and situated in the middle part of epigynum. Ducts transparent and extending in the anterior direction. Spermathecae divided into two parts, respectively, and round: anterior part pale, and posterior part darker.

Male palp (Figs. 14-15). Tibia with a retrolateral apophysis not so developed,

slender. Bulb relatively simple without tegular apophysis, embolus long and curved, its distal part extending approximately a half of the length of tegulum.

Coloration and markings. ♀♂, Cephalothorax and maxillae light brown. Chelicerae reddish brown. Labium brown. Sternum yellowish brown, legs, palps and spinnerets yellowish brown. Dorsum and venter of abdomen gray without markings.

*Distribution.* Indonesia: Krakatau Islands (Sertung, Panjang).

*Remarks.* Male palp and female genitalia of this new species are closely similar to those of *Clubiona melanosticta* THORELL, 1890, from Sumatra, and *C. papuana* CHRYSANTHUS, 1967, from New Guinea. But this new species can be distinguished from them by the shape of tegulum of male palp and the situation of copulatory openings of female genitalia.

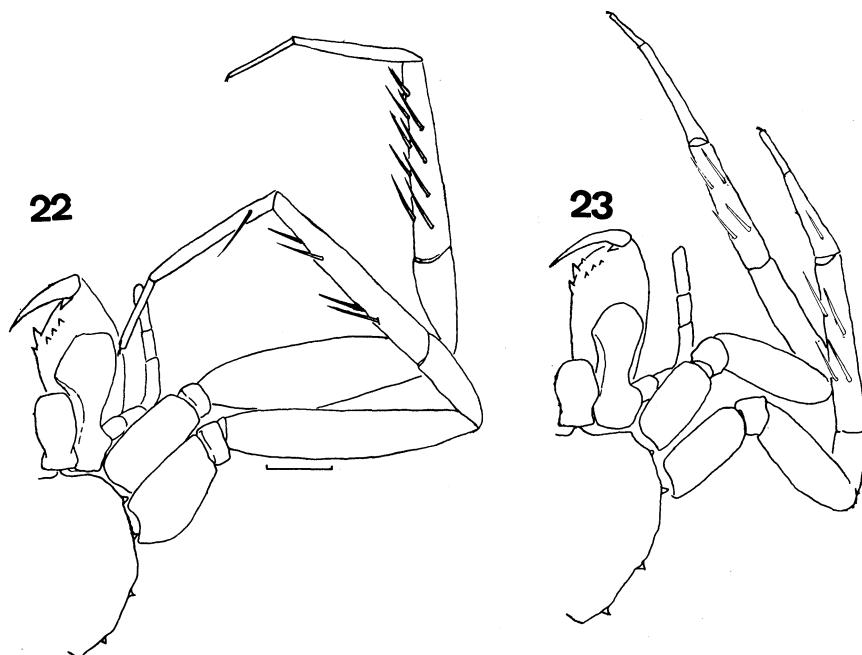
Judging from the structure and shapes of male palp and female genitalia, this new species seems to be an intermediate one between *Clubiona melanosticta* THORELL, 1890 and *C. papuana* CHRYSANTHUS, 1967.

*Etymology.* The species name is an adjective derived from Sertung Island.

*Clubiona melanosticta* THORELL, 1890

(Figs. 19–21, 23.)

*Clubiona melanosticta* THORELL, 1890, p. 374 (♂).—DAMMERMAN, 1948, p. 559.—ROEWER, 1954, p. 506.



Figs. 22–23. Ventral spines on leg I and II.—22, *Clubiona sertungensis* sp. nov., female. 23, *Clubiona melanosticta* THORELL, 1890, female. (Scale: 0.5 mm.)

Table 4. Lengths of legs of *Clubiona melanosticta* THORELL, 1890 (♀; in mm).

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	1.34	0.95	1.07	0.78	0.44	4.58
II	1.56	0.98	1.27	0.90	0.44	5.15
III	1.12	0.73	0.93	1.02	0.39	4.19
IV	2.05	0.90	1.54	2.07	0.61	7.17

*Specimen examined.* 1 ♀, Panjang Island, Krakatau Islands, Indonesia, 17-VIII-4-IX-1990, W. NENTWIG leg.

*Description* (based on 1 ♀ from Panjang). Measurements (♀, in mm). Carapace length 2.68, width 1.85. Abdomen length 3.66, width 2.32. Eye size and interdistance: AME 0.14, ALE 0.12, PME 0.14, PLE 0.12; AME-AME 0.14, AME-ALE 0.09, PME-PME 0.37, PME-PLE 0.20. MOA anterior width 0.41, posterior width 0.64, length 0.37. Clypeus 0.06.

Legs. Leg-formula IV-II-I-III. Ventral spines on legs I and II (female): tibia I 2-2-0, II 2-1-1; metatarsus I without spines, II 1-0.

Female genitalia (Figs. 19-21). Two copulatory openings indistinct, situated close together in the middle part of epigynum. Ducts transparent and extending in the anterior direction. Spermathecae divided into two parts and rounded: anterior part pale, and posterior part darker, the anterior part slightly smaller than the posterior.

Coloration and markings (♀). Cephalothorax light brown. Chelicerae reddish brown. Maxillae and labium brown. Sternum, legs and palps yellowish brown. Spinnerets gray, dorsum and venter of abdomen gray without markings.

*Distribution.* Indonesia: Krakatau Islands (Panjang), New Guinea.

*Remarks.* The present species is related to *Clubiona sertungensis* sp. nov., *C. thorelli* ROEWER, 1951 from Sumatra and *C. papuana* CHRYSANTHUS, 1967 from New Guinea, but can be distinguished from them by the shape of spermatheca and the situation of copulatory openings of female genitalia.

The present species has a strong resemblance with *C. meraukensis* CHRYSANTHUS, 1967, from New Guinea, and it seems that they are conspecific.

#### Acknowledgements

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#### 摘要

インドネシア、クラカタウ諸島産のフクログモ科の4種を報告した。 *Cheiracanthium longipes* THORELL, 1890 と *Clubiona melanosticta* THORELL, 1890 の2既知種、および、*Clubiona nentwigi* sp. nov. と *C. sertungensis* sp. nov. の2新種を記載した。

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